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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/815,879	03/22/2001	Kazuyuki Doshita	P/1071-1254	7388

7590 07/02/2004

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EXAMINER	
SHARON, AYAL I	
ART UNIT	**PAPER NUMBER**
2123	

DATE MAILED: 07/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

SL

Office Action Summary	Application No.	Applicant(s)
	09/815,879	DOSHITA ET AL.
	Examiner	Art Unit
	Ayal I Sharon	2123

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 22 March 2001.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-43 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-4,7-21 and 24-43 is/are rejected.

7)☒ Claim(s) 5,6,22 and 23 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 25 June 2001 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 2/27/2002.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Introduction

1. Claims 1-43 of U.S. Application 09/815,879 filed on 03/22/2001 are presented for examination. The application claims priority to a Japanese application filed on 3/22/2000.

Information Disclosure Statement

2. Applicants filed an IDS on 2/27/2002 which contained an English translation of the JPO rejection of the priority Japanese application.

3. The Japanese rejection contained two reasons for rejection:

    a. Evidence that the claimed invention had been "publicly worked in Japan prior to the application". The evidence presented was an article in the January 2000 edition of Design Magazine. This date of this reference is 3 months prior to the priority filing date, which is less than the 12 months specified in 35 USC 102(b). Therefore the reference is not applicable for rejection in the U.S. application.

    b. Further evidence was version history of the Murata EMI Filter Selection Simulator downloaded from the internet. Examiner has downloaded the document and notes that the earliest version date, for Version 1.0.0, is Sept.10, 1999. This date of this reference is 6 months prior to the priority

filing date, less than the 12 months specified in 35 USC 102(b). Therefore the reference is not applicable for rejection in the U.S. application.

4. The Japanese rejection makes reference to an article by A. Kotani, "Anti-Noise Effect Using EMI Filter Selection Support Software." The Applicants have provided a Japanese language copy of the reference, but have not provided an English language translation or an English language abstract. The reference has therefore not been considered.
5. Applicants have submitted a CD-ROM. This application was examined as an IFW application, and not as a paper file. Therefore the CD-ROM has not been considered.

Allowable Subject Matter

6. Claims 5-6 and 22-23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and all intervening claims.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

   A person shall be entitled to a patent unless –

   (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. The prior art used for these rejections is as follows:

9. Sandler, S. <u>SMPS Simulation with SPICE 3.</u> Chapter 4: EMI Filter Design. (Henceforth referred to as "**Sandler**"). The copyright listed on this document, which was downloaded from the internet, is ©1994-2004. According to the Amazon.com website, the published book with the same author and title, ISBN 0079132278, was published on December 1, 1996. This is the date used by the Examiner.

10. The claim rejections are hereby summarized for Applicant's convenience. The detailed rejections follow.

11. **Claims 1-4, 7, 20-21, and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Sandler.**

12. In regards to Claim 1, Sandler teaches the following limitations:

> 1. A method for analyzing noise in a digital circuit which incorporates a digital IC, a passive circuit, and a transmission line, said method comprising the steps of:
>
> obtaining the transfer function of said digital circuit based on the circuit constants of an equivalent circuit of said digital IC constituted of passive components; the circuit constants of said passive circuit; and the circuit constants of said transmission line;

(Sandler, especially: "Defining the Negative Resistance" page, last para., which teaches that "The simplist method is the Transfer Function (.TF) analysis, which calculates the DC gain and the small signal input and output impedence. The following example uses the SPICE .TF analysis to measure the input resistance of a switching power circuit." The following 2 pages are "Example 1 – Input Resistance Analysis", which show the .TF function being used.)

> expanding an input signal to be supplied to said digital circuit into a sine wave series by Fourier expansion;

(Sandler, especially: "Defining the Harmonic Content Page", which teaches that "If the current waveform is known, a Fourier analysis can be performed ...", as well as the equations for a Fourier series of harmonic n. Figure 3.2 shows the the output of the FFT feature used to calculate the harmonics of a square waveform.)

obtaining a frequency-domain output spectrum of said digital circuit from the transfer function of said digital circuit and the Fourier-expanded input signal; and

(Sandler, especially: "Defining the Harmonic Content Page", which teaches that "If the current waveform is known, a Fourier analysis can be performed …", as well as the equations for a Fourier series of harmonic n. Figure 3.2 shows the the output of the FFT feature used to calculate the harmonics of a square waveform.)

transforming said frequency-domain output spectrum into a time-domain output waveform by an inverse Fourier transformation.

(Sandler, especially: "Example 3 – Using the Optimizer to Calculate Harmonics". Fig. 3.3 shows the time domain of the Fundamental Harmonic frequency as computed by the IsSpice Optimizer. It is inherent that the inverse Fourier Transform was used, because this is the only way to go from the frequency domain to the time domain.)

13. In regards to Claim 2, Sandler teaches the following limitations:

2. A storage medium storing a program for controlling a computer for analyzing noise in a digital circuit which incorporates a digital IC, a passive circuit, and a transmission line, said program comprising the steps of:

obtaining the transfer function of said digital circuit from the circuit constants of an equivalent circuit of said digital IC constituted of passive components; the circuit constants of said passive circuit; and the circuit constants of said transmission line;

(Sandler, especially: "Defining the Negative Resistance" page, last para., which teaches that "The simplist method is the Transfer Function (.TF) analysis, which calculates the DC gain and the small signal input and output impedence. The following example uses the SPICE .TF analysis to measure the input resistance of a switching power circuit." The following 2 pages are "Example 1 – Input Resistance Analysis", which show the .TF function being used.)

expanding an input signal to be supplied to said digital circuit into a sine-wave series by Fourier expansion;

(Sandler, especially: "Defining the Harmonic Content Page", which teaches that "If the current waveform is known, a Fourier analysis can be performed …", as well as the equations for a Fourier series of harmonic n. Figure 3.2 shows the The output of the FFT feature used to calculate the harmonics of a square waveform.)

obtaining a frequency-domain output spectrum of said digital circuit from the transfer function of said digital circuit and said sine-wave series; and

(Sandler, especially: "Defining the Harmonic Content Page", which teaches that "If the current waveform is known, a Fourier analysis can be performed …", as well as the equations for a Fourier series of harmonic n. Figure

3.2 shows the the output of the FFT feature used to calculate the harmonics of a square waveform.)

transforming said frequency-domain output spectrum into a time-domain output waveform by inverse Fourier transformation.

(Sandler, especially: "Example 3 – Using the Optimizer to Calculate Harmonics". Fig. 3.3 shows the time domain of the Fundamental Harmonic frequency as computed by the IsSpice Optimizer. It is inherent that the inverse Fourier Transform was used, because this is the only way to go from the frequency domain to the time domain.)

14. In regards to Claim 3, Sandler teaches the following limitations:

3. An apparatus for analyzing noise in a digital circuit which incorporates a digital IC, a passive circuit, and a transmission line, said apparatus comprising:

first input means for inputting the circuit constants of an equivalent circuit of said digital IC constituted of passive components;

(Sandler, especially: "Example 1 – Input Resistance Analysis",, and the Spice circuit listing in the "Forth Order Filters" section. Spice uses a text-based input means for all parameters.)

second input means for inputting the circuit constants of said passive circuit;

(Sandler, especially: "Example 1 – Input Resistance Analysis",, and the Spice circuit listing in the "Forth Order Filters" section. Spice uses a text-based input means for all parameters.)

third input means for inputting the circuit constants of said transmission line;

(Sandler, especially: "Example 1 – Input Resistance Analysis",, and the Spice circuit listing in the "Forth Order Filters" section. Spice uses a text-based input means for all parameters.)

first operation means for obtaining the transfer function of said digital circuit from said circuit constants of said equivalent circuit of said digital IC, said circuit constants of said passive circuit, and said circuit constants of said transmission line;

(Sandler, especially: "Defining the Negative Resistance" page, last para., which teaches that "The simplist method is the Transfer Function (.TF) analysis, which calculates the DC gain and the small signal input and output impedence. The following example uses the SPICE .TF analysis to measure the input resistance of a switching power circuit." The following 2 pages are "Example 1 – Input Resistance Analysis", which show the .TF function being used.)

second operation means for expanding an input signal to be supplied to said digital circuit into a sine-wave series by a Fourier expansion;

(Sandler, especially: "Defining the Harmonic Content Page", which teaches that "If the current waveform is known, a Fourier analysis can be performed ...", as well as the equations for a Fourier series of harmonic n. Figure 3.2 shows the the output of the FFT feature used to calculate the harmonics of a square waveform.)

third operation means for obtaining a frequency-domain output spectrum of said digital. circuit from the transfer function of said digital circuit and said sine-wave series; and

(Sandler, especially: "Defining the Harmonic Content Page", which teaches that "If the current waveform is known, a Fourier analysis can be performed ...", as well as the equations for a Fourier series of harmonic n. Figure 3.2 shows the the output of the FFT feature used to calculate the harmonics of a square waveform.)

fourth operation means for transforming said frequency-domain output spectrum into a time-domain output waveform by an inverse Fourier transformation.

(Sandler, especially: "Example 3 – Using the Optimizer to Calculate Harmonics". Fig. 3.3 shows the time domain of the Fundamental Harmonic frequency as computed by the IsSpice Optimizer. It is inherent that the inverse Fourier Transform was used, because this is the only way to go from the frequency domain to the time domain.)

15. In regards to Claim 4, Sandler teaches the following limitations:

4. An apparatus for analyzing noise in a digital circuit according to Claim 3, further comprising:

first storing means for storing the circuit constants of respective equivalent circuits of a plurality of digital ICs,

(Sandler, especially: "Example 1 – Input Resistance Analysis",, and the Spice circuit listing in the "Forth Order Filters" section. Spice uses a text-based input means for all parameters.)

whereby the circuit constants of a digital IC selected from said plurality of digital ICs are readable out from said first storing means to be input to said first operation means.

(Sandler, especially: "Example 1 – Input Resistance Analysis",, and the Spice circuit listing in the "Forth Order Filters" section. Spice uses a text-based input means for all parameters.)

16. In regards to Claim 7, Sandler teaches the following limitations:

7. An apparatus for analyzing noise in a digital circuit according to any one of Claims 3 to 6, further comprising:

second storing means for storing the circuit constants of a plurality of passive circuits,

(Sandler, especially: "Example 1 – Input Resistance Analysis",, and the Spice circuit listing in the "Forth Order Filters" section. Spice uses a text-based input means for all parameters.)

whereby the circuit constants of a passive circuit selected from said plurality of passive circuits are readable out from said second storing means to be input to the first operation means.

(Sandler, especially: "Example 1 – Input Resistance Analysis",, and the Spice circuit listing in the "Forth Order Filters" section. Spice uses a text-based input means for all parameters.)

17. **Claims 20-21 and 24 are rejected based on the same reasoning as claims 3-4 and 7. Claims 20-21 and 24 are apparatus claims that recite the equivalent limitations as are recited in method claims 3-4 and 7, and taught throughout Sandler. The difference is that claims 20-21 and 24 use the more specific "interface" and "operation unit" language instead of the broader "means for" language used in claims 3-4 and 7.**

Claim Rejections - 35 USC § 103

18. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

19. The prior art used for these rejections is as follows:

20. Sandler, S. <u>SMPS Simulation with SPICE 3.</u> Chapter 4: EMI Filter Design. (Henceforth referred to as "**Sandler**"). The copyright listed on this document,

which was downloaded from the internet, is ©1994-2004. According to the Amazon.com website, the published book with the same author and title, ISBN 0079132278, was published on December 1, 1996. This is the date used by the Examiner.

21. MicroSim Pspice & Basics: User's Guide. Chapter 13, "Analyzing Waveforms in Probe". June, 1997. pp.13-1 to 13-23. (Henceforth referred to as "**PSpice**").

22. Hageman, S. "Use Ferrite Bead Models to analyze EMI Suppression." MicroSim Application Notes. June, 1997. pp.240-251. (Henceforth referred to as "**Hageman**").

23. The claim rejections are hereby summarized for Applicant's convenience. The detailed rejections follow.

24. **Claims 8-19 and 25-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sandler in view of Pspice.**

25. In regards to Claim 8, Sandler does not expressly teach the following limitations:

> 8. An apparatus for analyzing noise in a digital circuit according to Claim 7, further comprising:
>
> a display for displaying passive circuit characteristics when selecting one of said plurality of passive circuits.

Pspice, on the other hand, expressly teaches (p.13-2) that:

> With Probe you can
>
> - View simulation results in multiple plot windows
> - Compare simulation results from multiple circuit designs, including checkpoint schematics, in a single plot window
> - Display simple voltages, currents, and noise data
> - Display complex arithmetic expressions that use the basic measurements

- Display Fourier transformations of voltages and currents, or of arithmetic expressions involving voltages and currents
- Add text labels and other annotation symbols for clarification

It would have been obvios to one of ordinary skill in the art to modify the teachings of Sandler with of Pspice, because Sander teaches the use of Spice, and Pspice teaches the features of Pspice, which is a version of Spice.

26. In regards to Claim 9, Sandler does not expressly teach the following limitations:

9. An apparatus for analyzing noise in a digital circuit according to Claim 8, wherein said display further displays the frequency-domain output spectrum obtained by said third operation means and the time-domain output waveform obtained by said fourth operation means.

Pspice, on the other hand, expressly teaches (p.13-2) that:

With Probe you can

- View simulation results in multiple plot windows
- Compare simulation results from multiple circuit designs, including checkpoint schematics, in a single plot window
- Display simple voltages, currents, and noise data
- Display complex arithmetic expressions that use the basic measurements
- Display Fourier transformations of voltages and currents, or of arithmetic expressions involving voltages and currents
- Add text labels and other annotation symbols for clarification

It would have been obvios to one of ordinary skill in the art to modify the teachings of Sandler with of Pspice, because Sander teaches the use of Spice, and Pspice teaches the features of Pspice, which is a version of Spice.

27. In regards to Claim 10, Sandler does not expressly teach the following limitations:

10. An apparatus for analyzing noise in a digital circuit according to Claim 9, wherein said display simultaneously displays the results of a plurality of simulations performed for different transfer functions.

Pspice, on the other hand, expressly teaches (p.13-2) that:

With Probe you can

- View simulation results in multiple plot windows
- Compare simulation results from multiple circuit designs, including checkpoint schematics, in a single plot window
- Display simple voltages, currents, and noise data
- Display complex arithmetic expressions that use the basic measurements
- Display Fourier transformations of voltages and currents, or of arithmetic expressions involving voltages and currents
- Add text labels and other annotation symbols for clarification

It would have been obvios to one of ordinary skill in the art to modify the teachings of Sandler with of Pspice, because Sander teaches the use of Spice, and Pspice teaches the features of Pspice, which is a version of Spice.

28. In regards to Claim 11, Sandler does not expressly teach the following limitations:

11. An apparatus for analyzing noise in a digital circuit according to Claim 9, wherein said display further displays the impedance-frequency characteristics of said digital circuit.

Pspice, on the other hand, expressly teaches (p.13-2) that:

With Probe you can

- View simulation results in multiple plot windows
- Compare simulation results from multiple circuit designs, including checkpoint schematics, in a single plot window
- Display simple voltages, currents, and noise data
- Display complex arithmetic expressions that use the basic measurements
- Display Fourier transformations of voltages and currents, or of arithmetic expressions involving voltages and currents
- Add text labels and other annotation symbols for clarification

It would have been obvios to one of ordinary skill in the art to modify the teachings of Sandler with of Pspice, because Sander teaches the use of Spice, and Pspice teaches the features of Pspice, which is a version of Spice.

29. In regards to Claim 12, Sandler does not expressly teach the following limitations:

12. An apparatus for analyzing noise in a digital circuit according to Claim 11, wherein said display simultaneously displays the results of a plurality of simulations performed for different transfer functions.

Pspice, on the other hand, expressly teaches (p.13-2) that:

With Probe you can

- View simulation results in multiple plot windows
- Compare simulation results from multiple circuit designs, including checkpoint schematics, in a single plot window
- Display simple voltages, currents, and noise data
- Display complex arithmetic expressions that use the basic measurements
- Display Fourier transformations of voltages and currents, or of arithmetic expressions involving voltages and currents
- Add text labels and other annotation symbols for clarification

It would have been obvios to one of ordinary skill in the art to modify the teachings of Sandler with of Pspice, because Sander teaches the use of Spice, and Pspice teaches the features of Pspice, which is a version of Spice.

30. In regards to Claim 13, Sandler does not expressly teach the following limitations:

13. An apparatus for analyzing noise in a digital circuit according to Claim 7, further comprising:

a display for displaying the frequency-domain output spectrum obtained by said third operation means and the time-domain output waveform obtained by said fourth operation means.

Pspice, on the other hand, expressly teaches (p.13-2) that:

With Probe you can

- View simulation results in multiple plot windows
- Compare simulation results from multiple circuit designs, including checkpoint schematics, in a single plot window
- Display simple voltages, currents, and noise data
- Display complex arithmetic expressions that use the basic measurements
- Display Fourier transformations of voltages and currents, or of arithmetic expressions involving voltages and currents
- Add text labels and other annotation symbols for clarification

It would have been obvios to one of ordinary skill in the art to modify the teachings of Sandler with of Pspice, because Sander teaches the use of Spice, and Pspice teaches the features of Pspice, which is a version of Spice.

31. In regards to Claim 14, Sandler does not expressly teach the following limitations:

14. An apparatus for analyzing noise in a digital circuit according to Claim 13, wherein said display simultaneously displays the results of a plurality of simulations performed for different transfer functions.

Pspice, on the other hand, expressly teaches (p.13-2) that:

With Probe you can

- View simulation results in multiple plot windows
- Compare simulation results from multiple circuit designs, including checkpoint schematics, in a single plot window
- Display simple voltages, currents, and noise data
- Display complex arithmetic expressions that use the basic measurements
- Display Fourier transformations of voltages and currents, or of arithmetic expressions involving voltages and currents
- Add text labels and other annotation symbols for clarification

It would have been obvios to one of ordinary skill in the art to modify the teachings of Sandler with of Pspice, because Sander teaches the use of Spice, and Pspice teaches the features of Pspice, which is a version of Spice.

32. In regards to Claim 15, Sandler does not expressly teach the following limitations:

15. An apparatus for analyzing noise in a digital circuit according to any one of Claims 3 to 6, further comprising:

a display for displaying the frequency-domain output spectrum obtained by said third operation means and the time-domain output waveform obtained by said fourth operation means.

Pspice, on the other hand, expressly teaches (p.13-2) that:

With Probe you can

- View simulation results in multiple plot windows
- Compare simulation results from multiple circuit designs, including checkpoint schematics, in a single plot window
- Display simple voltages, currents, and noise data
- Display complex arithmetic expressions that use the basic measurements
- Display Fourier transformations of voltages and currents, or of arithmetic expressions involving voltages and currents
- Add text labels and other annotation symbols for clarification

It would have been obvios to one of ordinary skill in the art to modify the teachings of Sandler with of Pspice, because Sander teaches the use of Spice, and Pspice teaches the features of Pspice, which is a version of Spice.

33. In regards to Claim 16, Sandler does not expressly teach the following limitations:

16. An apparatus for analyzing noise in a digital circuit according to Claim 15, wherein said display simultaneously displays the results of a plurality of simulations performed for different transfer functions.

Pspice, on the other hand, expressly teaches (p.13-2) that:

With Probe you can

- View simulation results in multiple plot windows
- Compare simulation results from multiple circuit designs, including checkpoint schematics, in a single plot window
- Display simple voltages, currents, and noise data
- Display complex arithmetic expressions that use the basic measurements
- Display Fourier transformations of voltages and currents, or of arithmetic expressions involving voltages and currents
- Add text labels and other annotation symbols for clarification

It would have been obvios to one of ordinary skill in the art to modify the teachings of Sandler with of Pspice, because Sander teaches the use of Spice, and Pspice teaches the features of Pspice, which is a version of Spice.

34. In regards to Claim 17, Sandler does not expressly teach the following limitations:

17. An apparatus for analyzing noise in a digital circuit according to Claim 15, wherein said display further displays the impedance-frequency characteristics of said digital circuit.

Pspice, on the other hand, expressly teaches (p.13-2) that:

With Probe you can

- View simulation results in multiple plot windows
- Compare simulation results from multiple circuit designs, including checkpoint schematics, in a single plot window
- Display simple voltages, currents, and noise data
- Display complex arithmetic expressions that use the basic measurements
- Display Fourier transformations of voltages and currents, or of arithmetic expressions involving voltages and currents
- Add text labels and other annotation symbols for clarification

It would have been obvios to one of ordinary skill in the art to modify the teachings of Sandler with of Pspice, because Sander teaches the use of Spice, and Pspice teaches the features of Pspice, which is a version of Spice.

35. In regards to Claim 18, Sandler does not expressly teach the following limitations:

> 18. An apparatus for analyzing noise in a digital circuit according to Claim 17, wherein said display simultaneously displays the results of a plurality of simulations performed for different transfer functions.

Pspice, on the other hand, expressly teaches (p.13-2) that:

> With Probe you can
>
> - View simulation results in multiple plot windows
> - Compare simulation results from multiple circuit designs, including checkpoint schematics, in a single plot window
> - Display simple voltages, currents, and noise data
> - Display complex arithmetic expressions that use the basic measurements
> - Display Fourier transformations of voltages and currents, or of arithmetic expressions involving voltages and currents
> - Add text labels and other annotation symbols for clarification

It would have been obvios to one of ordinary skill in the art to modify the teachings of Sandler with of Pspice, because Sander teaches the use of Spice, and Pspice teaches the features of Pspice, which is a version of Spice.

36. In regards to Claim 19, Sandler does not expressly teach the following limitations:

> 19. An apparatus for analyzing noise in a digital circuit according to Claim 3, further comprising:
> printing means for simultaneously printing input information regarding the transfer function of said digital circuit, and the result of simulation.

Pspice, on the other hand, expressly teaches (p.13-2) that:

> With Probe you can
>
> - View simulation results in multiple plot windows
> - Compare simulation results from multiple circuit designs, including checkpoint schematics, in a single plot window

- Display simple voltages, currents, and noise data
- Display complex arithmetic expressions that use the basic measurements
- Display Fourier transformations of voltages and currents, or of arithmetic expressions involving voltages and currents
- Add text labels and other annotation symbols for clarification

It would have been obvios to one of ordinary skill in the art to modify the teachings of Sandler with of Pspice, because Sander teaches the use of Spice, and Pspice teaches the features of Pspice, which is a version of Spice.

37. **Claims 25-36 are rejected based on the same reasoning as claims 8-19. Claims 25-36 are apparatus claims that recite the equivalent limitations as are recited in method claims 8-19, and taught throughout Sandler. The difference is that claims 25-36 use the more specific "interface" and "operation unit" language instead of the broader "means for" language used in claims 8-19.**

38. **Claims 37, 40-41, and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sandler in view of Hageman.**

39. In regards to Claim 37, Sandler teaches the following limitations:

37. A method of enabling a user to select a passive circuit, said passive circuit being included in a digital circuit along with a digital IC and a transmission line, comprising the steps of:

(Sandler, especially: p.1 of "EMI Filter Design", which teaches that "The main purpose of the EMI filter is to limit the interference which is conducted or radiated from the power circuit ... Input EMI filters may also be used to limit inrush current, reduce conducted susceptibility, and suppress spikes."

Moreover, the EMI filter shown on p.2 of "Fourth Order Filters" is a circuit that consists of passive components. It is therefore a passive circuit.)

supplying said user with a program for analyzing noise in said digital circuit, on the basis of circuit constants of said digital IC, said transmission line, and said passive

circuit;

(Sandler, especially: p.1 of "EMI Filter Design", which teaches that "The main purpose of the EMI filter is to limit the interference which is conducted or radiated from the power circuit ... Input EMI filters may also be used to limit inrush current, reduce conducted susceptibility, and suppress spikes."

Moreover, the EMI filter shown on p.2 of "Fourth Order Filters" is a circuit that consists of passive components. It is therefore a passive circuit.)

Sandler, on the other hand, does not expressly teach the following limitations:

and supplying said user with circuit constants of a plurality of passive circuits,

thereby enabling said user to select a passive circuit from among said plurality of passive circuits on the basis of an analysis result of said program.

However, Hageman does teach this (See Hageman, p.240, para.2; and p.251, "To Download Files from the BBS"). Hageman expressly teaches the constants for "The Fair-Rite #43 and #73 bead models presented in this article ...".

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Sandler with those of Hageman, because Sandler teaches using Spice to model EMI filters, while Hageman teaches using Pspice (a version of Spice) for the same purpose. Hageman expressly teaches that: "With today's high performance systems, it is now important to consider the [ferrite] bead's real properties and how to analyze the resulting circuit." (Hageman, p.240, para.2).

40. In regards to Claim 40, Sandler teaches the following limitations:

40. A method according to claim 37, wherein said program comprises the steps of;

obtaining the transfer function of said digital circuit from the circuit constants of an equivalent circuit of said digital IC constituted of passive components; the circuit constants of said passive circuit; and the circuit constants of said transmission line;

(Sandler, especially: "Defining the Negative Resistance" page, last para., which teaches that "The simplist method is the Transfer Function (.TF) analysis, which calculates the DC gain and the small signal input and output impedence. The following example uses the SPICE .TF analysis to measure the input resistance of a switching power circuit." The following 2 pages are "Example 1 – Input Resistance Analysis", which show the .TF function being used.)

expanding an input signal to be supplied to said digital circuit into a sine-wave series by Fourier expansion;

(Sandler, especially: "Defining the Harmonic Content Page", which teaches that "If the current waveform is known, a Fourier analysis can be performed ...", as well as the equations for a Fourier series of harmonic n. Figure 3.2 shows the the output of the FFT feature used to calculate the harmonics of a square waveform.)

obtaining a frequency-domain output spectrum of said digital circuit from the transfer function of said digital circuit and said sine-wave series; and

(Sandler, especially: "Defining the Harmonic Content Page", which teaches that "If the current waveform is known, a Fourier analysis can be performed ...", as well as the equations for a Fourier series of harmonic n. Figure 3.2 shows the the output of the FFT feature used to calculate the harmonics of a square waveform.)

transforming said frequency-domain output spectrum into a time-domain output waveform by inverse Fourier transformation.

(Sandler, especially: "Example 3 – Using the Optimizer to Calculate Harmonics". Fig. 3.3 shows the time domain of the Fundamental Harmonic frequency as computed by the IsSpice Optimizer. It is inherent that the inverse Fourier Transform was used, because this is the only way to go from the frequency domain to the time domain.)

41. In regards to Claim 41, Sandler teaches the following limitations:

41. A method according to claim 40, wherein said passive components are filters.
(Sandler, especially: all of the chapter titled "EMI Filter Design".)

The cited chapter in Sandler is teaches "EMI Filter Design".

42. In regards to Claim 43, Sandler does not expressly teach the following

limitations:

43. A method according to claim 37, wherein said circuit constants are supplied to said user by making them available for downloading over a network.

However, Hageman does teach this (See Hageman, p.251, "To Download Files from the BBS").

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Sandler with those of Hageman, because doing so would facilitate the sharing of files among many users, especially those separated by great distances.

43. **Claims 38-39 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sandler in view of Hageman and further in view of Official Notice.**

44. In regards to Claim 38, Sandler does not expressly teach the following limitations:

38. A method according to claim 37, wherein said program is supplied to said user on a storage medium.

However, Official Notice is given that it is old and well known to supply a copy of a program on a storage medium such as a tape, floppy disk, CD-ROM, or DVD.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Sandler with those of Official Notice, because doing so would facilitate the sharing of program among many users, eliminating the need to manually type in the source code.

45. In regards to Claim 39, Sandler does not expressly teach the following limitations:

39. A method according to claim 37, wherein said program is supplied by making said program available for downloading over a network.

However, Official Notice is given that it is old and well known to connect computers to a network or networks, and to download files stored in remote drives.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Sandler with those of Official Notice, because doing so would facilitate the sharing of files among many users, especially those separated by great distances.

46. In regards to Claim 42, Sandler does not expressly teach the following limitations:

42. A method according to claim 37, wherein said circuit constants are supplied to said user on a storage medium.

However, Official Notice is given that it is old and well known to supply a copies of files on a storage medium such as a tape, floppy disk, CD-ROM, or DVD.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Sandler with those of Official Notice, because doing so would facilitate the sharing of program among many users, eliminating the need to manually type in the file contents.

Conclusion

47. The following prior art, made of record and not relied upon, is considered pertinent to applicant's disclosure.

48. Anonymous. "EMI / RFI filter kit eases circuit tests". Electronic Engineering Times. Nov.2, 1998. Issue 1033, pg.154.

49. Sandler, S. The SPICE Handbook of 50 Basic Circuits. Chapter 3: Circuit #10 EMI Filter. © 1994-2004.

50. Bowen et al. "EMIR: An Expert System for Electromagnetic Interference Resolution". Proc. 2nd Int'l Conf. on Indust. And Engineer. Applic. Of Artificial Int. and Expert Systems. 1989. pp.73-78.

51. Wang, Changchang et al. "Analysis and Suppression of Interference for On-Line Monitoring of Partial Discharge of Power Transformers." IEEE Annual Conf. on Electrical Insulation and Dielectric Phenomena. 1997. pp.530-533.

52. Chang, Chia-Nan et al. "Computerized Conducted EMI Filter Design Using LabVIEW and Its Application". Proc. Natl. Sci. Counc. ROC(A). Vol.25, No.3, 2001. pp.185-194. (This reference post-dates the priority filing date of the application, and is used to show the general state of the art at the time the invention was made.)

Correspondence Information

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kevin Teska can be reached on (703) 305-9704. Any response to this office action should be mailed to:

Director of Patents and Trademarks
Washington, DC 20231

Hand-delivered responses should be brought to the following office:

4th floor receptionist's office
Crystal Park 2
2121 Crystal Drive
Arlington, VA 22202

The fax phone number is: (703) 872-9306

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist, whose telephone number is: (703) 305-3900.

Ayal I. Sharon

Art Unit 2123

June 25, 2004

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